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AD847723

MECHANICAL PROPERTIES, INCLUDING FRACTURE-  
TOUGHNESS AND FATIGUE, AND RESISTANCE TO  
STRESS-CORROSION CRACKING OF STRESS-  
RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

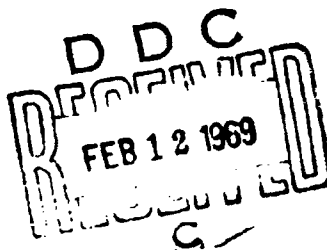
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Contract No. AF33(615)-3580  
BPSN: 66 (687381-738106-62405514)  
Sixth Quarterly Report  
June 15, 1967 - September 15, 1967  
New Kensington, Pa. September 15, 1967

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### ABSTRACT

The tensile, compressive, shear and bearing properties of 18 samples of 2014, 6061, 7075, 7079 and 7178 aluminum alloy extrusions in the TX51X tempers have been determined. Ratios among these properties have been computed.

Results of fatigue and stress-corrosion tests made to date are summarized.

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## SIXTH QUARTERLY REPORT

### MECHANICAL PROPERTIES, INCLUDING FRACTURE-TOUGHNESS AND FATIGUE, AND RESISTANCE TO STRESS-CORROSION CRACKING OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

#### I. Introduction.

The tests being made under this contract are for use in establishing design mechanical properties in MIL-HDBK-5A, including stress-strain and tangent-modulus curves, for 2014, 2024, 6061, 7075, 7079 and 7178 aluminum alloy extrusions in the TX51X tempers. For comparison, a limited number of similar tests are being made of extrusions in the "heat-treated-by-user" temper. Also, some fracture-toughness, axial-stress fatigue and stress-corrosion tests are being made.

This Sixth Quarterly Report summarizes the results of tensile, compressive, shear and bearing tests made in the past three months on 18 samples in the TX51X tempers and the results of fatigue and stress-corrosion tests made to date on samples of extrusions in the TX51X and "heat-treated-by-user" tempers. The total number of samples tested to date is 143 in the TX51X temper and 28 in the "heat-treated-by-user" temper.

All of the samples of commercially-produced extrusions to be tested on this contract now have been received. However, because of the inevitable fluctuations in customer orders, certain combinations of alloy, temper and thickness originally ordered did not become available. But, with the number of

extrusions received, the total number of tests required in the contract will be exceeded. Therefore, all unfilled orders have been cancelled.

It is planned that this will be the last quarterly report before issuance of the final report.

## II. Material.

A total of 143 samples of commercially-produced extrusions in the TX51X temper and 24 samples in the O temper have been received from two producers. The section thickness and identification of each sample is shown in Table I. The 24 as-received samples in the O temper have been heat treated, or heat treated and aged, in accordance with applicable conditions in MIL-H-6088D. Six samples each of 2024-O and 7075-O were tested in two "heat-treated-by-user" tempers, so that the total number of samples tested in those tempers is 36.

## III. Procedure.

The specimens and test procedures used are as outlined in the Fifth Quarterly Report, dated June 15, 1967.

## IV. Summary.

The results of the tensile, compressive, shear and bearing tests made in the past three months on 18 samples of extrusions in the TX51X temper are shown in Table II. The tensile properties of all samples exceed the values in applicable Federal Specifications; the specified minimum tensile properties for extrusions are shown in Table III.

The ratios among the tensile, compressive and shear properties of these extrusions are shown in Table IV and those of bearing to tensile properties are shown in Table V. The ratios among the properties at different locations with regard to thickness and width are shown in Table VI. The ratios among the bearing properties obtained using edgewise specimens to those obtained using flatwise specimens are shown in Table VII.

The tensile, compressive, shear and bearing (flatwise) tests of all the extrusions in the TX51X temper to be used in the contract have been completed. From the results of these tests the ratios of the various properties to the longitudinal tensile ultimate and yield values have been computed. Statistical analyses of these ratios are now being made to determine minimum ratios for use in computing "A" and "B" minimum design values for MIL-HDBK-5A.

All stress-strain tests have been completed. Minimum ("A" value) and typical tensile and compressive stress-strain and compressive tangent-modulus curves will be prepared on the basis of data from these tests and the minimum ratios now being determined by statistical analysis.

The results of the axial-stress fatigue tests ( $R=0.0$ ) made to date are shown in Figs. 1 through 7.

The current status of the stress-corrosion tests for extrusions in the TX51X and "heat-treated-by-user" tempers is shown in Tables VIII and IX, respectively.

Presently, the remaining tensile, compressive, shear, bearing, fatigue, fracture-toughness and stress-corrosion

4.

specimens of samples in the TX51X tempers and "heat-treated-by-user" tempers are being machined or tested.

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V. Tables and Figures.



TABLE II  
MECHANICAL PROPERTIES OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS  
A77(615)-580

Section Thickness, In.	Cross-Sectional Area, In. <sup>2</sup>	Location*	Direction*	Tensile Strength, psi	Yield Strength, psi	Elong. in 2 in. or 4D, %	Comp. Stress, psi	Shear Ultimate Stress, psi	Properties		
									Ultimate Stress, psi	Yield Stress, psi	Extensile Yield Stress, psi
0.628	3.4	3A0464	T/2, W/A	71 400	64 100	11.4	64 800	39 900	105 600	137 000	88 300
				69 600	62 200	15.6	66 000	39 000	106 200	137 000	89 300
				70 800	63 600	10.0	64 400	40 000	106 200	137 000	89 300
				69 300	62 100	10.0	64 600	40 000	106 200	137 000	89 300
1.775	3A0471	T/2, W/A	T/2, W/2	68 500	63 400	11.8	61 600	43 300	103 800	134 900	90 100
				67 900	62 100	5.0	63 000	42 400	105 400	132 400	90 600
				68 800	63 400	11.0	65 900	40 600	105 400	132 400	90 600
				67 900	61 700	5.7	65 900	40 600	105 400	132 400	90 600
0.180	3A0482	T/2	T/2	49 200	46 000	12.0	46 500	28 000	81 600	105 500	70 200
				46 900	43 400	30.0	46 500	28 000	81 600	105 500	70 200
				44 500	40 400	14.5	46 200	28 000	76 600	100 000	61 000
				48 000	43 000	18.8	46 200	28 000	76 600	100 000	61 000
1.490	3A0484	T/2, W/A	T/2, W/2	53 200	48 900	16.0	49 400	29 500	76 000	98 900	61 800
				48 300	43 400	15.0	46 400	28 000	76 000	98 900	61 800
				48 300	43 400	15.0	46 400	28 000	76 000	98 900	61 800
				48 300	43 400	15.0	46 400	28 000	76 000	98 900	61 800
0.153	3A0390	T/2	T/2	86 400	77 900	10.0	77 900	50 200	127 800	159 000	112 100
				88 500	79 600	10.0	85 900	50 200	132 400	159 000	113 300
				86 400	77 900	10.0	77 900	50 200	127 800	159 000	112 100
				88 500	79 600	10.0	85 900	50 200	132 400	159 000	113 300
1.188	3A0614	T/2, W/A	T/2, W/2	86 400	79 600	13.0	78 000	50 200	128 400	151 600	108 000
				84 000	73 200	13.0	78 000	50 200	128 400	151 600	108 000
				86 400	79 600	11.5	78 000	50 200	128 400	151 600	108 000
				84 000	73 200	14.0	78 000	50 200	128 400	151 600	108 000
2.812	3A0494	T/2, W/A	T/2, W/2	90 400	83 600	10.5	84 300	48 400	127 800	159 000	102 300
				79 300	70 900	10.0	77 100	45 800	121 800	155 300	97 100
				88 500	81 100	10.0	81 700	45 800	121 800	155 300	97 100
				71 000	68 400	7.1	74 800	47 100	117 000	148 600	96 600

TABLE II

TABLE II (Cont.)  
MECHANICAL PROPERTIES OF STRESS-RELIEVED STRUTTED ALUMINUM ALLOY EXTENSIONS  
[AP73(615)-3500]

Section Thickness, In.	Sample Cross- Sectional Area, In. <sup>2</sup>	Number	Location	Direction	Tensile Stress, psi	Elong. in 2 in. or %	Comp. Yield Stress, psi	Shear Ultimate Stress, psi	Biaxial			Edgewise		
									Ultimate Stress, psi	Field Stress, psi	$e/D=1.5$	Ultimate Stress, psi	Field Stress, psi	$e/D=1.5$
5.000	30.0	340503	T/4, W/4	L	86 700	10.0	77 900	45 900	116 100	152 000	97 800	118 100	145 100	96 000
			T/2, W/2	L	73 700	10.0	70 200	44 400	115 400	149 400	98 600	106 200	141 600	95 400
			T/2, W/2	ST	73 100	10.0	71 300	45 100	115 300	145 700	97 600	113 000	143 000	95 900
			T/2, W/2	ST	72 600	9.5	66 800	44 700	--	--	--	--	--	--
1.188	27.1	340512	T/2, W/4	L	74 000	12.8	64 700	43 900	112 100	144 300	91 200	100 600	136 700	87 500
			T/2, W/4	L	72 600	11.2	66 900	42 900	111 500	146 000	90 800	101 300	135 400	87 300
			T/2, W/2	L	74 500	12.0	65 900	43 300	112 000	143 700	91 800	101 300	132 900	87 700
			T/2, W/2	ST	73 700	12.5	66 500	42 300	112 800	145 500	89 400	100 600	135 000	86 500
2.812	11.3	340525	T/4, W/4	L	74 400	11.5	67 300	42 200	111 100	142 600	88 600	108 200	136 100	87 400
			T/2, W/2	L	73 000	10.2	67 700	40 800	107 400	138 400	85 900	102 400	136 400	85 500
			T/2, W/2	ST	67 400	11.3	67 400	40 800	107 400	138 400	85 900	102 400	136 400	85 500
			T/2, W/2	ST	67 100	5.0	61 100	42 000	--	--	--	--	--	--
3.000	24.3	340532	T/4, W/4	L	76 100	11.5	66 800	41 700	112 600	144 300	82 900	107 400	137 300	88 800
			T/2, W/2	L	72 200	9.0	66 200	41 600	112 600	142 300	82 700	107 400	137 300	87 400
			T/2, W/2	L	75 300	11.0	66 000	41 400	107 100	139 800	82 100	103 100	132 800	87 400
			T/2, W/2	ST	70 500	9.5	64 800	39 900	106 900	140 300	85 000	102 500	131 100	82 000
			T/2, W/2	ST	66 500	8.0	64 400	41 700	--	--	--	--	--	--
5.000	30.0	340504	T/4, W/4	L	72 700	12.0	64 400	41 900	104 200	137 100	85 800	103 400	134 700	84 500
			T/2, W/2	L	71 100	8.0	60 600	40 100	105 700	131 700	87 100	102 900	128 300	83 400
			T/2, W/2	L	68 800	11.5	59 900	40 800	102 900	132 200	82 500	99 400	128 300	82 100
			T/2, W/2	ST	65 300	9.0	57 300	41 400	--	--	--	--	--	--
			T/2, W/2	ST	65 200	8.0	56 700	39 800	--	--	--	--	--	--
0.040	0.45	340490	T/2	L	78 500	11.0	74 500	--	122 500	155 400	102 300	115 800	--	--
0.535	1.8	340532	T/2, W/4	L	88 400	12.0	82 900	48 300	126 900	162 800	103 200	117 300	--	--
			T/2, W/2	L	85 800	12.0	80 200	46 200	122 900	159 700	99 300	117 500	--	--
			T/2, W/2	L	77 400	10.0	76 500	46 000	--	--	--	--	--	--
0.065	0.33	340491	T/2	L	85 900	9.0	84 800	--	129 900	169 100	106 800	126 900	--	--
0.290	3.6	340506	T/2	L	86 100	5.0	85 800	--	--	--	--	--	--	--
1.188	27.1	340510	T/2, W/4	L	91 700	10.5	83 200	50 800	129 000	162 500	109 600	125 700	--	--
			T/2, W/2	L	89 700	14.5	86 100	47 000	131 800	161 100	113 600	139 200	--	--
			T/2, W/4	L	91 800	10.5	84 200	52 000	137 600	162 900	117 100	132 100	110 121 400	110 121 400
			T/2, W/2	L	90 500	10.5	85 000	51 500	136 500	162 500	117 000	136 500	107 500	128 600
			T/2, W/2	L	91 900	12.0	86 000	52 000	135 700	169 000	114 900	132 200	109 500	132 100
			T/2, W/2	ST	89 200	12.5	86 200	50 500	135 000	162 000	114 500	135 000	108 900	132 400
1.500	11.3	340537	T/2, W/4	L	93 300	10.0	83 400	50 000	130 300	163 400	109 300	136 200	108 600	137 600
			T/2, W/2	L	88 700	7.9	80 800	48 300	126 300	161 400	108 700	130 300	107 100	132 500
			T/2, W/2	L	91 900	10.0	86 500	49 500	129 300	161 400	108 700	130 300	107 100	132 500
			T/2, W/2	ST	86 600	8.0	85 000	47 000	126 900	157 500	108 600	122 500	98 000	121 100

\* T - Thickness; W - Width  
+ L - Longitudinal; ST - Short-Transverse  
# Offset equals 0.2 per cent  
\* Producer's, all others from Producer A  
\*\* Specimens and pictures cleaned ultrasonically in Tomsol solvent  
\*\*\* Offset equals 2 per cent of pin diameter  
†† 9.4118 Short-TX specimen; 3/4-in. dia; 1-in. gage length

TABLE II (Cont.)

TABLE III  
SPECIFIED MINIMUM VALUES\* FOR ALUMINUM ALLOY EXTRUSIONS  
[AF33(615)-3580]

Alloy and Temper	Thickness, in.	Area, sq. in.	Tensile			Federal Specification
			Ultimate Stress, psi	Yield Stress,† psi	Elongation 2 in. or 4D, %	
2014-T62	≤ 0.749	All	60 000	53 000	7	QQ-A-200/2b
-T6510	≤ 0.499	All	60 000	53 000	7	
	0.500-0.749	All	64 000	58 000	7	
	≥ 0.750	≥ 25	68 000	60 000	7	
2024-T3510,	≤ 0.249	All	57 000	42 000	12	QQ-A-200/3b
-T3511	0.250-0.749	All	60 000	44 000	12	
	0.750-1.499	All	65 000	46 000	10	
	≥ 1.500	≥ 25	70 000	52 000	10	
	≥ 1.500	≥ 25, ≥ 32	68 000	48 000	8	
-T42	≤ 0.749	All	57 000	38 000	12	
	≥ 1.500	≥ 25	57 000	38 000	10	
-T8510,	0.050-0.249	All	64 000	56 000	4	
-T8511	0.250-1.499	All	66 000	58 000	5	
	≥ 1.500	≥ 32	66 000	58 000	5	
-T62	≤ 0.749	--	--	--	--	None
	≥ 1.500	--	--	--	--	
6061-T62*,	≤ 0.249	All	38 000	35 000	8**	QQ-A-200/8b
-T6510	≥ 0.250	All	38 000	35 000	10	
7075-T62*,	≤ 0.249	All	78 000	70 000	7	QQ-A-200/11b
-T6510	0.250-0.499	All	81 000	73 000	7	
	0.500-2.999	All	81 000	72 000	7	
	3.000-4.499	≥ 20	81 000	71 000	7	
	3.000-4.499	≥ 20, ≥ 32	78 000	70 000	6	
	4.500-5.000	≥ 32	78 000	68 000	6	
-T73,	≤ 0.249	--	--	--	--	None
-T73510	0.250-0.499	--	--	--	--	
	0.500-1.499	--	--	--	--	
	1.500-2.999	--	--	--	--	
	3.000-4.499	--	--	--	--	
	4.500-5.000	--	--	--	--	
7079-T62*,	≤ 0.249	≥ 20	75 000	67 000	7	QQ-A-200/12b
-T6510	0.250-0.499	≥ 20	77 000	68 000	7	
	0.500-1.499	≥ 20	78 000	70 000	7	
7178-T62*	≤ 0.061	≥ 20	79 000**	73 000**	5	QQ-A-200/13
	0.250-1.499	≥ 20	82 000**	74 000**	5	
-T6510	0.062-0.249	≥ 20	84 000**	76 000**	5	
	0.250-1.499	≥ 25	87 000**	78 000**	5	
	1.500-2.499	≥ 25	86 000	77 000**	5	

\* All values are as shown in the Aluminum Association Booklet, "Standards for Aluminum Mill Products," 1967.

† Offset equals 0.2 per cent.

\* In QQ-A-200/8b, 11b, 12b and 13, values for T6 temper apply also for extrusions heat treated and aged by user (T62 temper).

\*\* Lower than in Federal specifications.

TABLE III

TABLE IV  
RATIOS AMONG THE TENSILE COMPRESSIVE AND SHEAR PROPERTIES  
OF STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

AP53(615)-3580

Section Thickness, in.	Sample Cross- Sectional Area, in. <sup>2</sup>	Number	Location*	T <sub>1</sub> (L) T <sub>1</sub> (L)	T <sub>2</sub> (ST) T <sub>2</sub> (L)	T <sub>3</sub> (LT) T <sub>3</sub> (L)	T <sub>4</sub> (ST) T <sub>4</sub> (L)	T <sub>5</sub> (L) T <sub>5</sub> (L)	T <sub>6</sub> (LT) T <sub>6</sub> (L)	T <sub>7</sub> (ST) T <sub>7</sub> (L)	T <sub>8</sub> (L) T <sub>8</sub> (L)	T <sub>9</sub> (L) T <sub>9</sub> (L)	T <sub>10</sub> (L) T <sub>10</sub> (L)	T <sub>11</sub> (L) T <sub>11</sub> (L)	T <sub>12</sub> (L) T <sub>12</sub> (L)	T <sub>13</sub> (L) T <sub>13</sub> (L)	T <sub>14</sub> (L) T <sub>14</sub> (L)	T <sub>15</sub> (L) T <sub>15</sub> (L)	T <sub>16</sub> (L) T <sub>16</sub> (L)	T <sub>17</sub> (L) T <sub>17</sub> (L)	T <sub>18</sub> (L) T <sub>18</sub> (L)	T <sub>19</sub> (L) T <sub>19</sub> (L)	T <sub>20</sub> (L) T <sub>20</sub> (L)	T <sub>21</sub> (L) T <sub>21</sub> (L)	T <sub>22</sub> (L) T <sub>22</sub> (L)	T <sub>23</sub> (L) T <sub>23</sub> (L)	T <sub>24</sub> (L) T <sub>24</sub> (L)	T <sub>25</sub> (L) T <sub>25</sub> (L)	T <sub>26</sub> (L) T <sub>26</sub> (L)	T <sub>27</sub> (L) T <sub>27</sub> (L)	T <sub>28</sub> (L) T <sub>28</sub> (L)	T <sub>29</sub> (L) T <sub>29</sub> (L)	T <sub>30</sub> (L) T <sub>30</sub> (L)	T <sub>31</sub> (L) T <sub>31</sub> (L)	T <sub>32</sub> (L) T <sub>32</sub> (L)	T <sub>33</sub> (L) T <sub>33</sub> (L)	T <sub>34</sub> (L) T <sub>34</sub> (L)	T <sub>35</sub> (L) T <sub>35</sub> (L)	T <sub>36</sub> (L) T <sub>36</sub> (L)	T <sub>37</sub> (L) T <sub>37</sub> (L)	T <sub>38</sub> (L) T <sub>38</sub> (L)	T <sub>39</sub> (L) T <sub>39</sub> (L)	T <sub>40</sub> (L) T <sub>40</sub> (L)	T <sub>41</sub> (L) T <sub>41</sub> (L)	T <sub>42</sub> (L) T <sub>42</sub> (L)	T <sub>43</sub> (L) T <sub>43</sub> (L)	T <sub>44</sub> (L) T <sub>44</sub> (L)	T <sub>45</sub> (L) T <sub>45</sub> (L)	T <sub>46</sub> (L) T <sub>46</sub> (L)	T <sub>47</sub> (L) T <sub>47</sub> (L)	T <sub>48</sub> (L) T <sub>48</sub> (L)	T <sub>49</sub> (L) T <sub>49</sub> (L)	T <sub>50</sub> (L) T <sub>50</sub> (L)	T <sub>51</sub> (L) T <sub>51</sub> (L)	T <sub>52</sub> (L) T <sub>52</sub> (L)	T <sub>53</sub> (L) T <sub>53</sub> (L)	T <sub>54</sub> (L) T <sub>54</sub> (L)	T <sub>55</sub> (L) T <sub>55</sub> (L)	T <sub>56</sub> (L) T <sub>56</sub> (L)	T <sub>57</sub> (L) T <sub>57</sub> (L)	T <sub>58</sub> (L) T <sub>58</sub> (L)	T <sub>59</sub> (L) T <sub>59</sub> (L)	T <sub>60</sub> (L) T <sub>60</sub> (L)	T <sub>61</sub> (L) T <sub>61</sub> (L)	T <sub>62</sub> (L) T <sub>62</sub> (L)	T <sub>63</sub> (L) T <sub>63</sub> (L)	T <sub>64</sub> (L) T <sub>64</sub> (L)	T <sub>65</sub> (L) T <sub>65</sub> (L)	T <sub>66</sub> (L) T <sub>66</sub> (L)	T <sub>67</sub> (L) T <sub>67</sub> (L)	T <sub>68</sub> (L) T <sub>68</sub> (L)	T <sub>69</sub> (L) T <sub>69</sub> (L)	T <sub>70</sub> (L) T <sub>70</sub> (L)	T <sub>71</sub> (L) T <sub>71</sub> (L)	T <sub>72</sub> (L) T <sub>72</sub> (L)	T <sub>73</sub> (L) T <sub>73</sub> (L)	T <sub>74</sub> (L) T <sub>74</sub> (L)	T <sub>75</sub> (L) T <sub>75</sub> (L)	T <sub>76</sub> (L) T <sub>76</sub> (L)	T <sub>77</sub> (L) T <sub>77</sub> (L)	T <sub>78</sub> (L) T <sub>78</sub> (L)	T <sub>79</sub> (L) T <sub>79</sub> (L)	T <sub>80</sub> (L) T <sub>80</sub> (L)	T <sub>81</sub> (L) T <sub>81</sub> (L)	T <sub>82</sub> (L) T <sub>82</sub> (L)	T <sub>83</sub> (L) T <sub>83</sub> (L)	T <sub>84</sub> (L) T <sub>84</sub> (L)	T <sub>85</sub> (L) T <sub>85</sub> (L)	T <sub>86</sub> (L) T <sub>86</sub> (L)	T <sub>87</sub> (L) T <sub>87</sub> (L)	T <sub>88</sub> (L) T <sub>88</sub> (L)	T <sub>89</sub> (L) T <sub>89</sub> (L)	T <sub>90</sub> (L) T <sub>90</sub> (L)	T <sub>91</sub> (L) T <sub>91</sub> (L)	T <sub>92</sub> (L) T <sub>92</sub> (L)	T <sub>93</sub> (L) T <sub>93</sub> (L)	T <sub>94</sub> (L) T <sub>94</sub> (L)	T <sub>95</sub> (L) T <sub>95</sub> (L)	T <sub>96</sub> (L) T <sub>96</sub> (L)	T <sub>97</sub> (L) T <sub>97</sub> (L)	T <sub>98</sub> (L) T <sub>98</sub> (L)	T <sub>99</sub> (L) T <sub>99</sub> (L)	T <sub>100</sub> (L) T <sub>100</sub> (L)	T <sub>101</sub> (L) T <sub>101</sub> (L)	T <sub>102</sub> (L) T <sub>102</sub> (L)	T <sub>103</sub> (L) T <sub>103</sub> (L)	T <sub>104</sub> (L) T <sub>104</sub> (L)	T <sub>105</sub> (L) T <sub>105</sub> (L)	T <sub>106</sub> (L) T <sub>106</sub> (L)	T <sub>107</sub> (L) T <sub>107</sub> (L)	T <sub>108</sub> (L) T <sub>108</sub> (L)	T <sub>109</sub> (L) T <sub>109</sub> (L)	T <sub>110</sub> (L) T <sub>110</sub> (L)	T <sub>111</sub> (L) T <sub>111</sub> (L)	T <sub>112</sub> (L) T <sub>112</sub> (L)	T <sub>113</sub> (L) T <sub>113</sub> (L)	T <sub>114</sub> (L) T <sub>114</sub> (L)	T <sub>115</sub> (L) T <sub>115</sub> (L)	T <sub>116</sub> (L) T <sub>116</sub> (L)	T <sub>117</sub> (L) T <sub>117</sub> (L)	T <sub>118</sub> (L) T <sub>118</sub> (L)	T <sub>119</sub> (L) T <sub>119</sub> (L)	T <sub>120</sub> (L) T <sub>120</sub> (L)	T <sub>121</sub> (L) T <sub>121</sub> (L)	T <sub>122</sub> (L) T <sub>122</sub> (L)	T <sub>123</sub> (L) T <sub>123</sub> (L)	T <sub>124</sub> (L) T <sub>124</sub> (L)	T <sub>125</sub> (L) T <sub>125</sub> (L)	T <sub>126</sub> (L) T <sub>126</sub> (L)	T <sub>127</sub> (L) T <sub>127</sub> (L)	T <sub>128</sub> (L) T <sub>128</sub> (L)	T <sub>129</sub> (L) T <sub>129</sub> (L)	T <sub>130</sub> (L) T <sub>130</sub> (L)	T <sub>131</sub> (L) T <sub>131</sub> (L)	T <sub>132</sub> (L) T <sub>132</sub> (L)	T <sub>133</sub> (L) T <sub>133</sub> (L)	T <sub>134</sub> (L) T <sub>134</sub> (L)	T <sub>135</sub> (L) T <sub>135</sub> (L)	T <sub>136</sub> (L) T <sub>136</sub> (L)	T <sub>137</sub> (L) T <sub>137</sub> (L)	T <sub>138</sub> (L) T <sub>138</sub> (L)	T <sub>139</sub> (L) T <sub>139</sub> (L)	T <sub>140</sub> (L) T <sub>140</sub> (L)	T <sub>141</sub> (L) T <sub>141</sub> (L)	T <sub>142</sub> (L) T <sub>142</sub> (L)	T <sub>143</sub> (L) T <sub>143</sub> (L)	T <sub>144</sub> (L) T <sub>144</sub> (L)	T <sub>145</sub> (L) T <sub>145</sub> (L)	T <sub>146</sub> (L) T <sub>146</sub> (L)	T <sub>147</sub> (L) T <sub>147</sub> (L)	T <sub>148</sub> (L) T <sub>148</sub> (L)	T <sub>149</sub> (L) T <sub>149</sub> (L)	T <sub>150</sub> (L) T <sub>150</sub> (L)	T <sub>151</sub> (L) T <sub>151</sub> (L)	T <sub>152</sub> (L) T <sub>152</sub> (L)	T <sub>153</sub> (L) T <sub>153</sub> (L)	T <sub>154</sub> (L) T <sub>154</sub> (L)	T <sub>155</sub> (L) T <sub>155</sub> (L)	T <sub>156</sub> (L) T <sub>156</sub> (L)	T <sub>157</sub> (L) T <sub>157</sub> (L)	T <sub>158</sub> (L) T <sub>158</sub> (L)	T <sub>159</sub> (L) T <sub>159</sub> (L)	T <sub>160</sub> (L) T <sub>160</sub> (L)	T <sub>161</sub> (L) T <sub>161</sub> (L)	T <sub>162</sub> (L) T <sub>162</sub> (L)	T <sub>163</sub> (L) T <sub>163</sub> (L)	T <sub>164</sub> (L) T <sub>164</sub> (L)	T <sub>165</sub> (L) T <sub>165</sub> (L)	T <sub>166</sub> (L) T <sub>166</sub> (L)	T <sub>167</sub> (L) T <sub>167</sub> (L)	T <sub>168</sub> (L) T <sub>168</sub> (L)	T <sub>169</sub> (L) T <sub>169</sub> (L)	T <sub>170</sub> (L) T <sub>170</sub> (L)	T <sub>171</sub> (L) T <sub>171</sub> (L)	T <sub>172</sub> (L) T <sub>172</sub> (L)	T <sub>173</sub> (L) T <sub>173</sub> (L)	T <sub>174</sub> (L) T <sub>174</sub> (L)	T <sub>175</sub> (L) T <sub>175</sub> (L)	T <sub>176</sub> (L) T <sub>176</sub> (L)	T <sub>177</sub> (L) T <sub>177</sub> (L)	T <sub>178</sub> (L) T <sub>178</sub> (L)	T <sub>179</sub> (L) T <sub>179</sub> (L)	T <sub>180</sub> (L) T <sub>180</sub> (L)	T <sub>181</sub> (L) T <sub>181</sub> (L)	T <sub>182</sub> (L) T <sub>182</sub> (L)	T <sub>183</sub> (L) T <sub>183</sub> (L)	T <sub>184</sub> (L) T <sub>184</sub> (L)	T <sub>185</sub> (L) T <sub>185</sub> (L)	T <sub>186</sub> (L) T <sub>186</sub> (L)	T <sub>187</sub> (L) T <sub>187</sub> (L)	T <sub>188</sub> (L) T <sub>188</sub> (L)	T <sub>189</sub> (L) T <sub>189</sub> (L)	T <sub>190</sub> (L) T <sub>190</sub> (L)	T <sub>191</sub> (L) T <sub>191</sub> (L)	T <sub>192</sub> (L) T <sub>192</sub> (L)	T <sub>193</sub> (L) T <sub>193</sub> (L)	T <sub>194</sub> (L) T <sub>194</sub> (L)	T <sub>195</sub> (L) T <sub>195</sub> (L)	T <sub>196</sub> (L) T <sub>196</sub> (L)	T <sub>197</sub> (L) T <sub>197</sub> (L)	T <sub>198</sub> (L) T <sub>198</sub> (L)	T <sub>199</sub> (L) T <sub>199</sub> (L)	T <sub>200</sub> (L) T <sub>200</sub> (L)	T <sub>201</sub> (L) T <sub>201</sub> (L)	T <sub>202</sub> (L) T <sub>202</sub> (L)	T <sub>203</sub> (L) T <sub>203</sub> (L)	T <sub>204</sub> (L) T <sub>204</sub> (L)	T <sub>205</sub> (L) T <sub>205</sub> (L)	T <sub>206</sub> (L) T <sub>206</sub> (L)	T <sub>207</sub> (L) T <sub>207</sub> (L)	T <sub>208</sub> (L) T <sub>208</sub> (L)	T <sub>209</sub> (L) T <sub>209</sub> (L)	T <sub>210</sub> (L) T <sub>210</sub> (L)	T <sub>211</sub> (L) T <sub>211</sub> (L)	T <sub>212</sub> (L) T <sub>212</sub> (L)	T <sub>213</sub> (L) T <sub>213</sub> (L)	T <sub>214</sub> (L) T <sub>214</sub> (L)	T <sub>215</sub> (L) T <sub>215</sub> (L)	T <sub>216</sub> (L) T <sub>216</sub> (L)	T <sub>217</sub> (L) T <sub>217</sub> (L)	T <sub>218</sub> (L) T <sub>218</sub> (L)	T <sub>219</sub> (L) T <sub>219</sub> (L)	T <sub>220</sub> (L) T <sub>220</sub> (L)	T <sub>221</sub> (L) T <sub>221</sub> (L)	T <sub>222</sub> (L) T <sub>222</sub> (L)	T <sub>223</sub> (L) T <sub>223</sub> (L)	T <sub>224</sub> (L) T <sub>224</sub> (L)	T <sub>225</sub> (L) T <sub>225</sub> (L)	T <sub>226</sub> (L) T <sub>226</sub> (L)	T <sub>227</sub> (L) T <sub>227</sub> (L)	T <sub>228</sub> (L) T <sub>228</sub> (L)	T <sub>229</sub> (L) T <sub>229</sub> (L)	T <sub>230</sub> (L) T <sub>230</sub> (L)	T <sub>231</sub> (L) T <sub>231</sub> (L)	T <sub>232</sub> (L) T <sub>232</sub> (L)	T <sub>233</sub> (L) T <sub>233</sub> (L)	T <sub>234</sub> (L) T <sub>234</sub> (L)	T <sub>235</sub> (L) T <sub>235</sub> (L)	T <sub>236</sub> (L) T <sub>236</sub> (L)	T <sub>237</sub> (L) T <sub>237</sub> (L)	T <sub>238</sub> (L) T <sub>238</sub> (L)	T <sub>239</sub> (L) T <sub>239</sub> (L)	T <sub>240</sub> (L) T <sub>240</sub> (L)	T <sub>241</sub> (L) T <sub>241</sub> (L)	T <sub>242</sub> (L) T <sub>242</sub> (L)	T <sub>243</sub> (L) T <sub>243</sub> (L)	T <sub>244</sub> (L) T <sub>244</sub> (L)	T <sub>245</sub> (L) T <sub>245</sub> (L)	T <sub>246</sub> (L) T <sub>246</sub> (L)	T <sub>247</sub> (L) T <sub>247</sub> (L)	T <sub>248</sub> (L) T <sub>248</sub> (L)	T <sub>249</sub> (L) T <sub>249</sub> (L)	T <sub>250</sub> (L) T <sub>250</sub> (L)	T <sub>251</sub> (L) T <sub>251</sub> (L)	T <sub>252</sub> (L) T <sub>252</sub> (L)	T <sub>253</sub> (L) T <sub>253</sub> (L)	T <sub>254</sub> (L) T <sub>254</sub> (L)	T <sub>255</sub> (L) T <sub>255</sub> (L)	T <sub>256</sub> (L) T <sub>256</sub> (L)	T <sub>257</sub> (L) T <sub>257</sub> (L)	T <sub>258</sub> (L) T <sub>258</sub> (L)	T <sub>259</sub> (L) T <sub>259</sub> (L)	T <sub>260</sub> (L) T <sub>260</sub> (L)	T <sub>261</sub> (L) T <sub>261</sub> (L)	T <sub>262</sub> (L) T <sub>262</sub> (L)	T <sub>263</sub> (L) T <sub>263</sub> (L)	T <sub>264</sub> (L) T <sub>264</sub> (L)	T <sub>265</sub> (L) T <sub>265</sub> (L)	T <sub>266</sub> (L) T <sub>266</sub> (L)	T <sub>267</sub> (L) T <sub>267</sub> (L)	T <sub>268</sub> (L) T <sub>268</sub> (L)	T <sub>269</sub> (L) T <sub>269</sub> (L)	T <sub>270</sub> (L) T <sub>270</sub> (L)	T <sub>271</sub> (L) T <sub>271</sub> (L)	T <sub>272</sub> (L) T <sub>272</sub> (L)	T <sub>273</sub> (L) T <sub>273</sub> (L)	T <sub>274</sub> (L) T <sub>274</sub> (L)	T <sub>275</sub> (L) T <sub>275</sub> (L)	T <sub>276</sub> (L) T <sub>276</sub> (L)	T <sub>277</sub> (L) T <sub>277</sub> (L)	T <sub>278</sub> (L) T <sub>278</sub> (L)	T <sub>279</sub> (L) T <sub>279</sub> (L)	T <sub>280</sub> (L) T <sub>280</sub> (L)	T <sub>281</sub> (L) T <sub>281</sub> (L)	T <sub>282</sub> (L) T <sub>282</sub> (L)	T <sub>283</sub> (L) T <sub>283</sub> (L)	T <sub>284</sub> (L) T <sub>284</sub> (L)	T <sub>285</sub> (L) T <sub>285</sub> (L)	T <sub>286</sub> (L) T <sub>286</sub> (L)	T <sub>287</sub> (L) T <sub>287</sub> (L)	T <sub>288</sub> (L) T <sub>288</sub> (L)	T <sub>289</sub> (L) T <sub>289</sub> (L)	T <sub>290</sub> (L) T <sub>290</sub> (L)	T <sub>291</sub> (L) T <sub>291</sub> (L)	T <sub>292</sub> (L) T <sub>292</sub> (L)	T <sub>293</sub> (L) T <sub>293</sub> (L)	T <sub>294</sub> (L) T <sub>294</sub> (L)	T <sub>295</sub> (L) T <sub>295</sub> (L)	T <sub>296</sub> (L) T <sub>296</sub> (L)	T <sub>297</sub> (L) T <sub>297</sub> (L)	T <sub>298</sub> (L) T <sub>298</sub> (L)	T <sub>299</sub> (L) T <sub>299</sub> (L)	T <sub>300</sub> (L) T <sub>300</sub> (L)	T <sub>301</sub> (L) T <sub>301</sub> (L)	T <sub>302</sub> (L) T <sub>302</sub> (L)	T <sub>303</sub> (L) T <sub>303</sub> (L)	T <sub>304</sub> (L) T <sub>304</sub> (L)	T <sub>305</sub> (L) T <sub>305</sub> (L)	T <sub>306</sub> (L) T <sub>306</sub> (L)	T <sub>307</sub> (L) T <sub>307</sub> (L)	T <sub>308</sub> (L) T <sub>308</sub> (L)	T <sub>309</sub> (L) T <sub>309</sub> (L)	T <sub>310</sub> (L) T <sub>310</sub> (L)	T <sub>311</sub> (L) T <sub>311</sub> (L)	T <sub>312</sub> (L) T <sub>312</sub> (L)	T <sub>313</sub> (L) T <sub>313</sub> (L)	T <sub>314</sub> (L) T <sub>314</sub> (L)	T <sub>315</sub> (L) T <sub>315</sub> (L)	T <sub>316</sub> (L) T <sub>316</sub> (L)	T <sub>317</sub> (L) T <sub>317</sub> (L)	T <sub>318</sub> (L) T <sub>318</sub> (L)	T <sub>319</sub> (L) T <sub>319</sub> (L)	T <sub>320</sub> (L) T <sub>320</sub> (L)	T <sub>321</sub> (L) T <sub>321</sub> (L)	T <sub>322</sub> (L) T <sub>322</sub> (L)	T <sub>323</sub> (L) T <sub>323</sub> (L)	T <sub>324</sub> (L) T <sub>324</sub> (L)	T <sub>325</sub> (L) T <sub>325</sub> (L)	T <sub>326</sub> (L) T <sub>326</sub> (L)	T <sub>327</sub> (L) T <sub>327</sub> (L)	T <sub>328</sub> (L) T <sub>328</sub> (L)	T <sub>329</sub> (L) T <sub>329</sub> (L)	T <sub>330</sub> (L) T <sub>330</sub> (L)	T <sub>331</sub> (L) T <sub>331</sub> (L)	T <sub>332</sub> (L) T <sub>332</sub> (L)	T <sub>333</sub> (L) T <sub>333</sub> (L)	T <sub>334</sub> (L) T <sub>334</sub> (L)	T <sub>335</sub> (L) T <sub>335</sub> (L)	T <sub>336</sub> (L) T <sub>336</sub> (L)	T <sub>337</sub> (L) T <sub>337</sub> (L)	T <sub>338</sub> (L) T <sub>338</sub> (L)	T <sub>339</sub> (L) T <sub>339</sub> (L)	T <sub>340</sub> (L) T <sub>340</sub> (L)	T <sub>341</sub> (L) T <sub>341</sub> (L)	T <sub>342</sub> (L) T <sub>342</sub> (L)	T <sub>343</sub> (L) T <sub>343</sub> (L)	T <sub>344</sub> (L) T <sub>344</sub> (L)	T <sub>345</sub> (L) T <sub>345</sub> (L)	T <sub>346</sub> (L) T <sub>346</sub> (L)	T <sub>347</sub> (L) T <sub>347</sub> (L)	T <sub>348</sub> (L) T <sub>348</sub> (L)	T <sub>349</sub> (L) T <sub>349</sub> (L)	T <sub>350</sub> (L) T <sub>350</sub> (L)	T <sub>351</sub> (L) T <sub>351</sub> (L)	T <sub>352</sub> (L) T <sub>352</sub> (L)	T <sub>353</sub> (L) T <sub>353</sub> (L)	T <sub>354</sub> (L) T <sub>354</sub> (L)	T <sub>355</sub> (L) T <sub>355</sub> (L)	T <sub>356</sub> (L) T <sub>356</sub> (L)	T <sub>357</sub> (L) T <sub>357</sub> (L)	T <sub>358</sub> (L) T <sub>358</sub> (L)	T <sub>359</sub> (L) T <sub>359</sub> (L)	T <sub>360</sub> (L) T <sub>360</sub> (L)	T <sub>361</sub> (L) T <sub>361</sub> (L)	T <sub>362</sub> (L) T <sub>362</sub> (L)	T <sub>363</sub> (L) T <sub>363</sub> (L)	T <sub>364</sub> (L) T <sub>364</sub> (L)	T <sub>365</sub> (L) T <sub>365</sub> (L)	T <sub>366</sub> (L) T <sub>366</sub> (L)	T <sub>367</sub> (L) T <sub>367</sub> (L)	T <sub>368</sub> (L) T <sub>368</sub> (L)	T <sub>369</sub> (L) T <sub>369</sub> (L)	T <sub>370</sub> (L) T <sub>370</sub> (L)	T <sub>371</sub> (L) T <sub>371</sub> (L)	T <sub>372</sub> (L) T <sub>372</sub> (L)	T <sub>373</sub> (L) T <sub>373</sub> (L)	T <sub>374</sub> (L) T <sub>374</sub> (L)	T <sub>375</sub> (L) T <sub>375</sub> (L)	T <sub>376</sub> (L) T <sub>376</sub> (L)	T <sub>377</sub> (L) T <sub>377</sub> (L)	T <sub>378</sub> (L) T <sub>378</sub> (L)	T <sub>379</sub> (L) T <sub>379</sub> (L)	T <sub>380</sub> (L) T <sub>380</sub> (L)	T <sub>381</sub> (L) T <sub>381</sub> (L)	T <sub>382</sub> (L) T <sub>382</sub> (L)	T <sub>383</sub> (L) T <sub>383</sub> (L)	T <sub>384</sub> (L) T <sub>384</sub> (L)	T <sub>385</sub> (L) T <sub>385</sub> (L)	T <sub>386</sub> (L) T <sub>386</sub> (L)	T <sub>387</sub> (L) T <sub>387</sub> (L)	T <sub>388</sub> (L) T <sub>388</sub> (L)	T <sub>389</sub> (L) T <sub>389</sub> (L)	T <sub>390</sub> (L) T <sub>390</sub> (L)	T <sub>391</sub> (L) T <sub>391</sub> (L)	T <sub>392</sub> (L) T <sub>392</sub> (L)	T <sub>393</sub> (L) T <sub>393</sub> (L)	T <sub>394</sub> (L) T <sub>394</sub> (L)	T <sub>395</sub> (L) T <sub>395</sub> (L)	T <sub>396</sub> (L) T <sub>396</sub> (L)	T <sub>397</sub> (L) T <sub>397</sub> (L)	T <sub>398</sub> (L) T <sub>398</sub> (L)	T <sub>399</sub> (L) T <sub>399</sub> (L)	T <sub>400</sub> (L) T <sub>400</sub> (L)	T <sub>401</sub> (L) T <sub>401</sub> (L)	T <sub>402</sub> (L) T <sub>402</sub> (L)	T <sub>403</sub> (L) T <sub>403</sub> (L)	T <sub>404</sub> (L) T <sub>404</sub> (L)	T <sub>405</sub> (L) T <sub>405</sub> (L)	T <sub>406</sub> (L) T <sub>406</sub> (L)	T <sub>407</sub> (L) T <sub>407</sub> (L)	T <sub>408</sub> (L) T <sub>408</sub> (L)	T <sub>409</sub> (L) T <sub>409</sub> (L)	T <sub>410</sub> (L) T <sub>410</sub> (L)	T <sub>411</sub> (L) T <sub>411</sub> (L)	T <sub>412</sub> (L) T <sub>412</sub> (L)	T <sub>413</sub> (L) T <sub>413</sub> (L)	T <sub>414</sub> (L) T <sub>414</sub> (L)	T <sub>415</sub> (L) T <sub>415</sub> (L)	T <sub>416</sub> (L) T <sub>416</sub> (L)	T <sub>417</sub> (L) T <sub>417</sub> (L)	T <sub>418</sub> (L) T <sub>418</sub> (L)	T <sub>419</sub> (L) T <sub>419</sub> (L)	T <sub>420</sub> (L) T <sub>420</sub> (L)	T <sub>421</sub> (L) T <sub>421</sub> (L)	T <sub>422</sub> (L) T <sub>422</sub> (L)	T <sub>423</sub> (L) T <sub>423</sub> (L)	T <sub>424</sub> (L) T <sub>424</sub> (L)	T <sub>425</sub> (L) T <sub>425</sub> (L)	T <sub>426</sub> (L) T <sub>426</sub> (L)	T <sub>427</sub> (L) T <sub>427</sub> (L)	T <sub>428</sub> (L) T <sub>428</sub> (L)	T <sub>429</sub> (L) T <sub>429</sub> (L)	T <sub>430</sub> (L) T <sub>430</sub> (L)	T <sub>431</sub> (L) T <sub>431</sub> (L)	T <sub>432</sub> (L) T <sub>432</sub> (L)	T <sub>433</sub> (L) T<
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TABLE V  
RATIOS OF BEARING TO TENSILE PROPERTIES OF STRESS-RELIEVED STRETCHED  
ALUMINUM ALLOY EXTRUSIONS

(4733)(615)-7580

Section Thickness, in.	Sample Cross- Area, in. <sup>2</sup>	Number	Location*	Plate										Extrusion										
				BSI(1)/TSL(1) 0.75-1.5	BSI(1)/TSL(1) 1.5-2.0	BSI(1)/TSL(1) 2.0-2.5	BSI(1)/TSL(1) 2.5-3.0	BSI(1)/TSL(1) 3.0-3.5	BSI(1)/TSL(1) 3.5-4.0	BSI(1)/TSL(1) 4.0-4.5	BSI(1)/TSL(1) 4.5-5.0	BSI(1)/TSL(1) 5.0-5.5	BSI(1)/TSL(1) 5.5-6.0	BSI(1)/TSL(1) 6.0-6.5	BSI(1)/TSL(1) 6.5-7.0	BSI(1)/TSL(1) 7.0-7.5	BSI(1)/TSL(1) 7.5-8.0	BSI(1)/TSL(1) 8.0-8.5	BSI(1)/TSL(1) 8.5-9.0	BSI(1)/TSL(1) 9.0-9.5	BSI(1)/TSL(1) 9.5-10.0	BSI(1)/TSL(1) 10.0-10.5	BSI(1)/TSL(1) 10.5-11.0	
2014-T6510																								
0.628	3.4	340486*	T/2, W/A T/2, W/2	1.48 1.50	1.92 1.94	1.38 1.40	1.63 1.62	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1.755	7.2	340487*	T/2, W/A T/2, W/2	1.52 1.53	1.97 1.92	1.42 1.43	1.68 1.65	--	--	--	--	--	--	1.37 1.36	1.89 1.92	1.38 1.36	1.68 1.71	--	--	--	--	--	--	--
0.180	1.6	340482	T/2	1.66	2.14	1.53	1.70	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
1.490	4.5	340489*	T/2, W/A T/2, W/2	1.41 1.43	1.83 1.86	1.21 1.26	1.47 1.52	--	--	--	--	--	--	1.38 1.40	1.77 1.76	1.19 1.21	1.44 1.48	--	--	--	--	--	--	--
7075-T6510																								
0.153	4.0	340590	T/2	1.48	1.84	1.44	1.63	1.53	1.84	1.45	1.74	--	--	--	--	--	--	--	--	--	--	--	--	--
1.188	27.1	340591*	T/2, W/A T/2, W/2	1.51 1.48	1.87 1.84	1.36 1.33	1.57 1.53	1.49 1.45	1.82 1.78	1.36 1.34	1.64 1.60	--	--	1.26 1.29	1.71 1.72	1.27 1.26	1.52 1.53	1.31 1.28	1.76 1.77	1.26 1.24	1.57 1.56	1.26 1.24	1.47 1.46	
2.812	11.3	340594	T/2, W/A T/2, W/2	1.41 1.38	1.76 1.76	1.22 1.20	1.47 1.44	--	--	--	--	--	--	1.36 1.33	1.74 1.68	1.23 1.19	1.47 1.43	--	--	--	--	--	--	--
5.000	30.0	340503	T/2, W/A T/2, W/2	1.34 1.38	1.75 1.74	1.26 1.27	1.51 1.51	1.31	1.72	1.27	1.59	--	--	1.32 1.35	1.67 1.74	1.24 1.27	1.49 1.50	1.22	1.63	1.23	1.48	--	--	--
7075-T73510																								
1.188	27.1	340512	T/2, W/A T/2, W/2	1.51 1.50	1.95 1.93	1.43 1.42	1.71 1.68	1.51 1.51	1.97 1.95	1.43 1.36	1.73 1.73	--	--	1.36 1.32	1.85 1.78	1.38 1.39	1.73 1.66	1.27 1.26	1.83 1.81	1.37 1.37	1.66 1.65	--	--	--
2.812	11.3	340592	T/2, W/A T/2, W/2	1.49 1.47	1.82 1.85	1.35 1.33	1.57 1.58	--	--	--	--	--	--	1.45 1.41	1.86 1.86	1.33 1.32	1.58 1.58	--	--	--	--	--	--	--
3.000	24.3	340504	T/2, W/A T/2, W/2	1.48 1.45	1.90 1.85	1.40 1.39	1.64 1.66	1.48 1.42	1.88 1.85	1.36 1.38	1.65 1.54	--	--	1.41 1.37	1.80 1.76	1.33 1.35	1.68 1.64	1.25 1.24	1.73 1.74	1.21 1.24	1.50 1.49	--	--	--
5.000	30.0	340504	T/2, W/A T/2, W/2	1.43 1.45	1.88 1.88	1.35 1.37	1.60 1.61	1.45	1.95	1.37	1.72	--	--	1.42 1.44	1.85 1.87	1.33 1.36	1.62 1.64	1.27	1.76	1.32	1.61	--	--	--
7075-T6510																								
0.080	0.45	340490	T/2	1.56	1.98	1.40	1.59	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.340	1.8	340532	T/2, W/A T/2, W/2	1.44 1.46	1.84 1.90	1.35 1.37	1.42 1.50	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
7075-T6510																								
0.045	0.33	340491	T/2	1.44	1.88	1.39	1.53	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
0.340	3.6	340506	T/2	1.41	1.77	1.31	1.50	1.44	1.76	1.35	1.66	--	--	--	--	--	--	--	--	--	--	--	--	--
1.188	27.1	340519	T/2, W/A T/2, W/2	1.50 1.48	1.77 1.84	1.36 1.32	1.53 1.52	1.48 1.43	1.76 1.76	1.35 1.32	1.60 1.60	--	--	1.36 1.29	1.68 1.67	1.28 1.26	1.52 1.53	1.22	1.68	1.24	1.49	--	--	--
1.500	11.3	340557	T/2, W/A T/2, W/2	1.40 1.41	1.75 1.76	1.28 1.29	1.50 1.53	1.40 1.38	1.65 1.71	1.30 1.29	1.52 1.45	--	--	1.25	1.58	1.27	1.49	1.23	1.62	1.25	1.45	--	--	--

\* T - Thickness; W - Width  
† Producer B; all others from producer A  
Note: L - Longitudinal; LT - Long-Transverse

TABLE V

TABLE VI

RATIOS AMONG THE MECHANICAL PROPERTIES AT DIFFERENT LOCATIONS  
IN STRESS-RELIEVED STRETCHED ALUMINUM ALLOY EXTRUSIONS

AP33(615)-3580

Alloy and Temper	Sample		Direction*	Location†	Tensile		Compressive Yield Stress	Shear Ultimate Stress	Bearing	
	Section Thickness, in.	Gross- Sectional Area, in. <sup>2</sup>			Ultimate Stress	Yield Stress			Ultimate Stress σ/δ=1.5 σ/δ=2.0	Yield Stress σ/δ=1.5 σ/δ=2.0
2014-T6510	0.628	3.4	L†	W/2/W/4	0.99	0.99	0.99	0.98	1.01	1.01
					1.00	1.00	0.98	--	--	--
	1.755	7.2	L	TW/2/TW/4	1.00	1.00	1.02	0.96	1.02	1.01
					1.00	0.99	--	--	--	--
6061-T6510	1.490	4.5	L	W/2/W/4	0.98	0.97	0.97	1.05	0.99	1.01
					1.01	1.01	--	--	0.99	0.99
	1.188	27.1	L†	W/2/W/4	1.01	1.01	1.00	--	--	--
					1.00	1.00	1.00	0.97	0.99	0.99
7075-T6510	2.812	11.3	L†	TW/2/TW/4	0.98	0.97	0.97	0.95	0.95	0.95
					0.97	0.96	0.96	--	0.95	0.94
	5.000	30.0	L	TW/2/TW/4	0.97	0.95	0.92	0.98	0.99	0.96
					0.96	0.96	0.96	0.96	1.01	0.96
7075-T73510	1.188	27.1	L	W/2/W/4	1.01	1.02	0.99	0.99	1.00	1.01
					1.02	1.02	1.01	0.99	0.97	1.02
	2.812	11.3	L†	TW/2/TW/4	0.98	0.98	0.98	0.97	0.97	0.97
					0.98	0.98	0.97	--	0.96	0.96
7079-T6510	3.090	24.3	L	TW/4/TW/2	0.99	1.00	0.99	0.99	0.97	0.99
					0.98	0.97	0.98	0.96	0.98	0.97
	5.000	30.0	L	TW/2/TW/4	0.97	0.95	0.93	0.97	0.96	0.96
					0.97	0.95	0.95	1.03	0.98	0.97
7178-T6510	0.525	1.8	L†	W/2/W/4	0.95	0.95	0.97	0.96	0.97	1.00
					1.02	1.03	--	--	--	--
	1.188	27.1	L	W/2/W/4	1.00	1.00	1.01	1.01	0.99	0.98
					1.00	1.00	0.99	0.98	1.00	0.99
7178-T6510	1.500	11.3	L†	W/2/W/4	0.98	0.98	0.97	0.99	0.99	1.01
					0.98	0.98	0.97	0.99	1.01	0.98
	1.500	11.3	L	W/2/W/4	0.98	0.98	0.97	0.97	1.02	0.98
					0.98	0.97	0.97	0.97	0.98	0.97

\* L - Longitudinal; LT - Long Transverse

† T - Thickness, W - Width

‡ Edgewise bearing specimens; others - flatwise specimens

.. Producer B; all others from Producer A

TABLE VI

TABLE VII

RATIO OF BEARING PROPERTIES IN THE EDGEWISE DIRECTION TO THOSE IN THE  
FLATWISE DIRECTION FOR ALUMINUM ALLOY EXTRUSIONS

[AF33(615)-3580]

Alloy and Temper	Sample		Number	Location*	Direction†	Edgewise/Flatwise	
	Section Thickness, in.	Cross- Sectional Area, in. <sup>2</sup>				BUS(E)/BUS(F) e/D=1.5 e/D=2.0	BVS(E)/BVS(F) e/D=1.5 e/D=2.0
6061-T6510	1.490	4.5	340489‡	T/2, W/4	L	0.98	0.98
				T/2, W/2	L	0.98	0.98
7075-T6510	1.188	27.1	326914	T/2, W/4	L	0.84	0.93
					LT	0.88	0.93
				T/2, W/2	L	0.88	0.95
					LT	0.87	0.93
	2.812	11.3	340494	T/4, W/4	L	0.96	1.00
				T/2, W/2	L	0.96	0.99
7075-T73510	5.000	30.0	340503	T/4, W/4	L	0.98	0.99
					LT	0.94	0.97
				T/2, W/2	L	0.98	1.00
	1.188	27.1	326912	T/2, W/4	L	0.90	0.96
					LT	0.91	0.96
				T/2, W/2	L	0.88	0.99
7178-T6510	2.812	11.3	340495	T/4, W/4	LT	0.89	0.95
				T/2, W/2	L	0.97	1.00
	3.090	24.3	340392	T/4, W/4	L	0.96	1.00
					LT	0.95	1.03
				T/2, W/2	L	0.91	0.91
					LT	0.92	0.97
	5.000	30.0	340504	T/4, W/4	L	0.96	0.97
					LT	0.93	0.96
				T/2, W/2	L	0.99	1.01
					LT	0.94	0.93
7178-T6510	1.188	27.1	326919	T/2, W/4	L	0.99	1.01
					LT	0.84	0.99
				T/2, W/2	L	0.82	0.93
					LT	0.87	1.01
	1.500	11.3	340557	T/2, W/4	L	0.86	0.93
					LT	0.89	1.00
				T/2, W/2	L	0.88	0.96
					LT	0.83	0.99

\* T - Thickness; W - Width

† L - Longitudinal; LT - Long Transverse

‡ Producer B; all others from Producer A

TABLE VII

TABLE VIII

## RESISTANCE TO STRESS-CORROSION CRACKING OF STRESS-RELIEVED STRAIGHT ALUMINUM ALLOY EXTRUSIONS

Exposure: 2.5% NaCl Solution by Alternate Immersion  
Stressed - 75% Yield Strength

(633)(65)-3580

Alloy	Section Thickness, Inches	Number	Longitudinal			Long Transverse			Short Transverse		
			P/N*	Days**	Per Cent Loss in Tensile Strength†††	P/N†	Days**	Per Cent Loss in Tensile Strength†††	P/N*	Days**	Per Cent Loss in Tensile Strength†††
2014-T6510	0.250	340154	0/2	84	5	0/2	2, 2***	--	--	--	--
	0.625	340486	0/2	27					2/2	2, 2	
	1.755	340487*									
2024-T3510	0.255	317942	0/2	84	29	0/2	84	28	--	--	--
	0.510	317936	0/2	84	34	0/2	84	26	2/2	2, 2	26
	0.940	317944*	0/2	84	18	1/2	31(OK84)	42	2/2	2, 2	42
	1.200	317946*	0/2	84	14	2/2	7, 7	--	1/2	2, 2	40(OK84)
	2.760	318048	0/2	84	22	2/2	12, 26	--	2/2	2, 2	24, 245
	4.000	340214**	0/2	84	27	2/2	2, 5	--			
2024-T6510	0.255	317890	0/2	84	5	0/2	84	6	--	--	--
	0.510	317892	0/2	84	6	0/2	84	7	--	--	--
	0.960	317893*	0/2	84	6	0/2	84	9	0/2	84	84
	1.200	317895*	0/2	84	6	0/2	84	10	0/2	84	84
	2.760	318079	0/2	84	6	0/2	84	17	0/2	84	84
	4.000	340225**	0/2	84	6	0/2	84	9	0/2	84	84
6061-T6510	0.315	317953	0/2	84	0	0/2	84	0	--	--	--
	0.375	317927	0/2	84	4	0/2	84	1	--	--	--
	1.240	317907	0/2	84	0	0/2	84	0	--	--	--
	1.960	317896	0/2	84	0	0/2	84	0	--	--	--
	3.000	340227	0/2	84	0	0/2	84	0	0/2	84	84
7075-T6510	0.375	317954	0/2	84	3	1/2	17(OK84)	7	--	--	--
	0.415	317859	0/2	84	3	0/2	84	7	2/2	2, 2	1, 4
	0.935	340155*	0/2	84	3	1/2	72(OK84)	6	2/2	2, 2	4, 4
	1.185	317860*	0/2	84	3	1/2	8(OK84)	19	2/2	2, 2	4, 4
	2.190	318137	0/2	84	5	2/2	4, 4	--	2/2	2, 2	2, 2
	3.040	318138	0/2	84	5	2/2	2, 2	--	2/2	2, 2	2, 2
7075-T73510	0.275	340391	0/2	42	0	0/2	2, 2	0	--	--	--
	0.435	340503	0/2	27	0	0/2	2, 2	0	--	--	--
	0.475	317900	0/2	84	0	0/2	84	0	--	--	--
	0.935	317910	0/2	84	2	0/2	84	3	0/2	84	84
	1.000	340292*	0/2	84		0/2	84		0/2	84	84
	2.000	340439*	0/2	27		0/2	27		0/2	27	
7075-T6510	0.251	340253	0/2	84		0/2	27		0/2	27	
	0.500	340504	0/2	84		0/2	27		0/2	27	
7175-T6510	0.625	317997	0/2	84	9	1/2	81(OK84)	14	--	--	--
	1.200	318139*	0/2	84	10	2/2	3, 7	--	2/2	2, 2	4, 4
	1.500	340577	0/2	84	11	2/2	7, 7	--	2/2	2, 2	4, 4

TABLE VIII

\* P/N denotes number of specimens failed over number exposed.  
 †† Tests in progress for periods shown, with maximum duration of 84 days.  
 ††† Results are average values for tension tests of specimens which did not fail by stress-corrosion cracking.  
 \* Short transverse yield strengths determined by tests of duplicate 0.050 or 0.160 diameter tension specimens.  
 \*\* The directionality of these sections is being determined metallographically.  
 \*\*\* Failure occurred outside the reduced section beneath the protective coating used to isolate all parts of the stressing frame.  
 § Accumulated corrosion products prevented detection of these failures until specimens were chemically cleaned at termination of the exposure period.

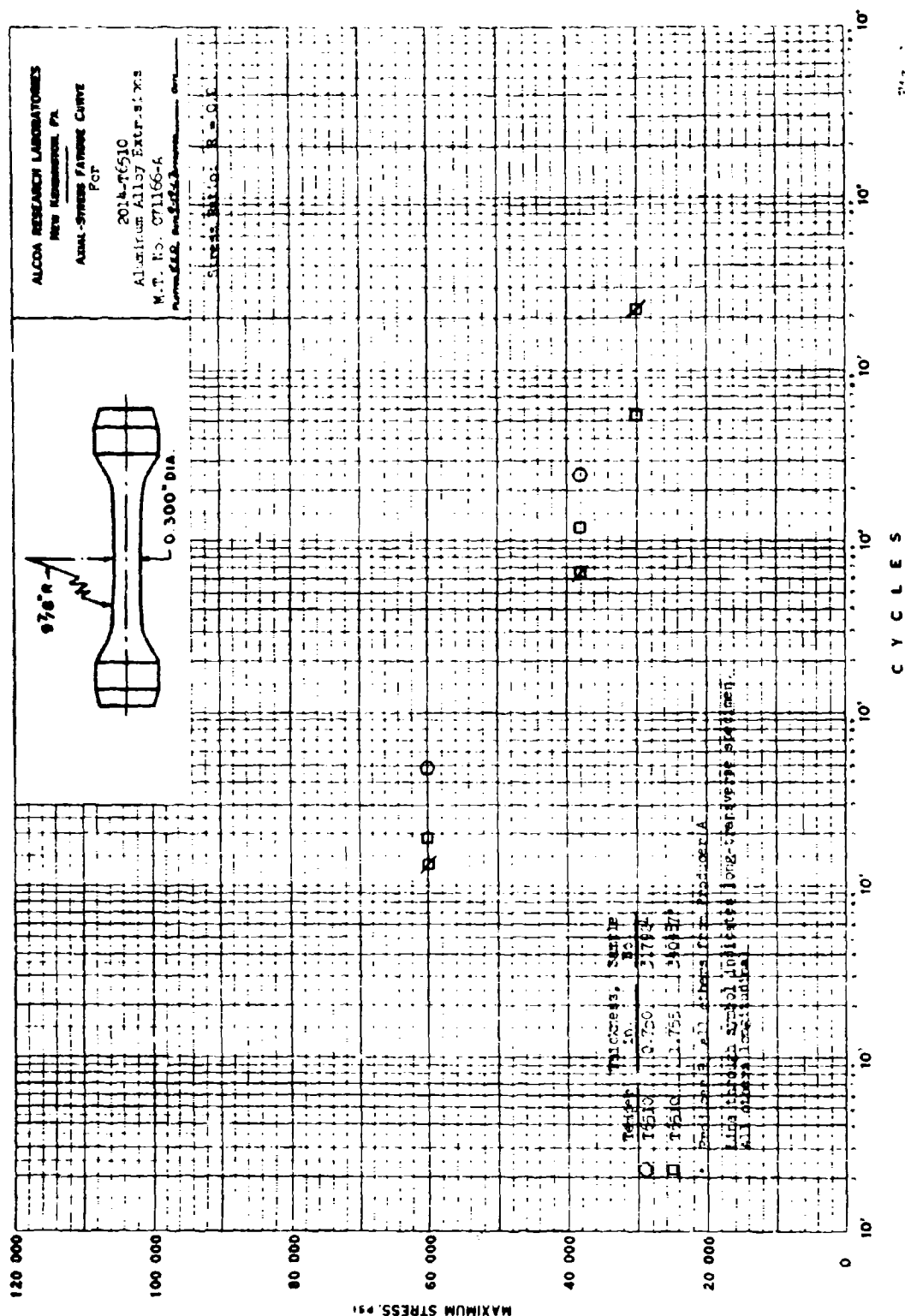
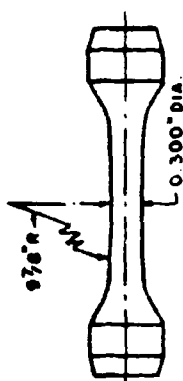
TABLE IX  
RESISTANCE TO STRESS-CORROSION CRACKING OF ALUMINUM ALLOY EXTRUSIONS  
IN THE "HEAT-TREATED-BY-USER" TEMPER  
Exposure: 3.5% NaCl Solution by Alternate Immersion  
Stressed  $\frac{75\%}{(F73(0.5)-350)}$  Yield Strength

Alloy	Section Thickness, Inches	Number	Longitudinal			Transverse			Short Transverse
			P/N*	Days**	Per Cent Loss in Tensile Strength***	P/N*	Days**	Per Cent Loss in Tensile Strength***	
2014-T62	0.300	318084	1/2	24** (OK84)	11	1/2	24** (OK84)	13	--
2024-T42	0.430	340241	0/2	84		0/2	84		2/2 44, 45
	2.562	340245	0/2	84		2/2	24	--	
2024-T52	0.430	340242	0/2	84		0/2	84		-- 54
	2.562	340246	0/2	84		0/2	84		-- 54
6061-T62	0.246	318090	0/2	84	5	0/2	84	2	-- 54
	1.625	318091*	0/2	84	2	0/2	84	1	-- 54
7075-T6	0.350	318096	0/2	84	6	0/2	84	7	-- 54
	1.225	318098*	0/2	84	4	0/2	84	6	-- 54
7075-T73	0.350	318097	0/2	84	2	0/2	84	4	-- 54
	1.225	318099*	0/2	84	1	0/2	84	5	-- 54
7178-T6	0.403	340249	2/2	37, 42	--	2/2	37, 42	--	--

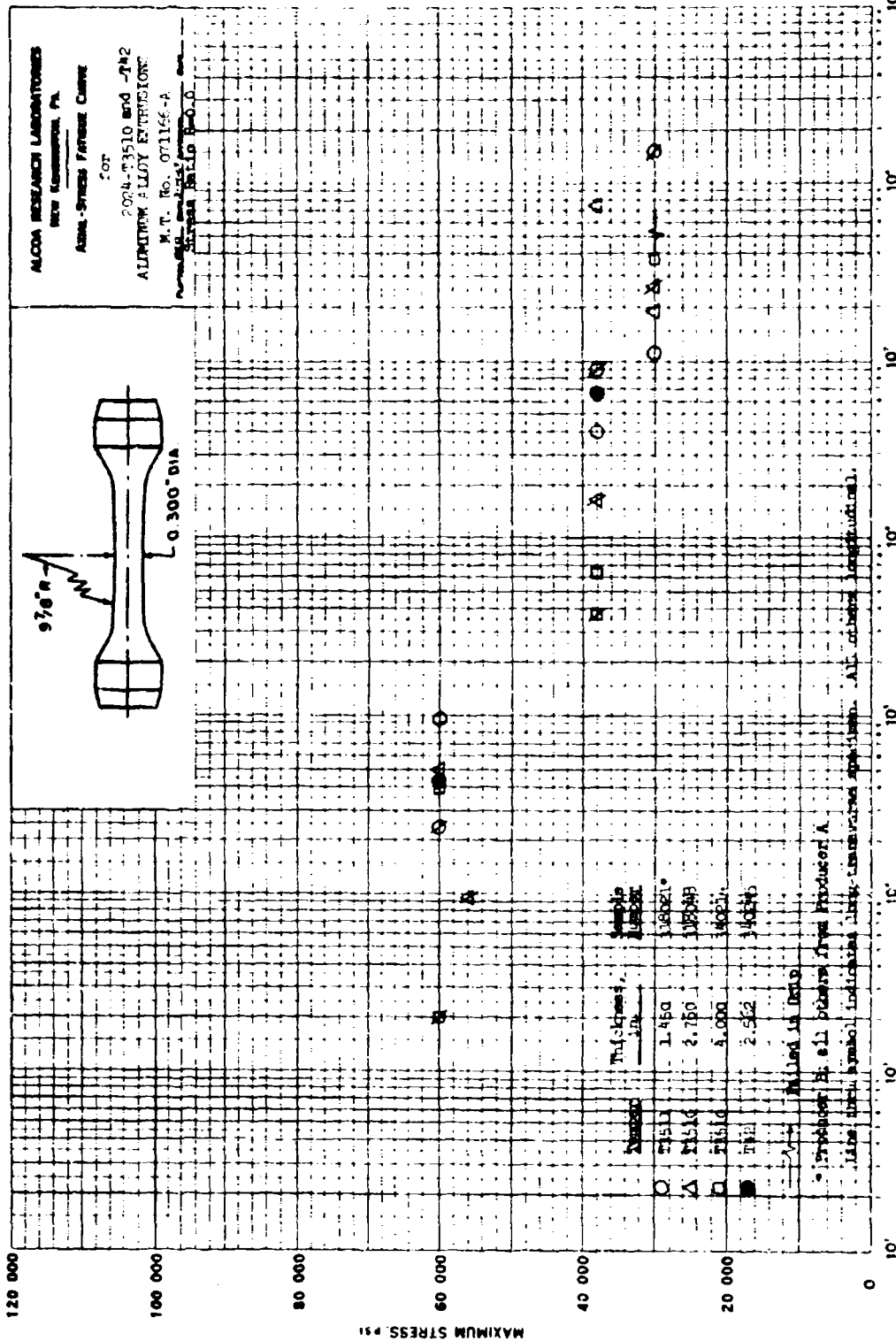
\* P/N denotes number of specimen; failed over number exposed.  
 \*\* Tests in progress for periods shown, with maximum duration of 84 days.  
 \*\*\* Results are average values for tension tests of specimens which did not fail by stress-corrosion cracking.  
 \* Short transverse yield strength is determined by tests of duplicate 0.050" diameter tension specimens.  
 \*\* Failure occurred outside the reduced section beneath the protective coating used to isolate all parts of the stressing frame.  
 \* Accumulated corrosion products prevented ready detection of these failures. Specimens were chemically cleaned to confirm suspected failure.

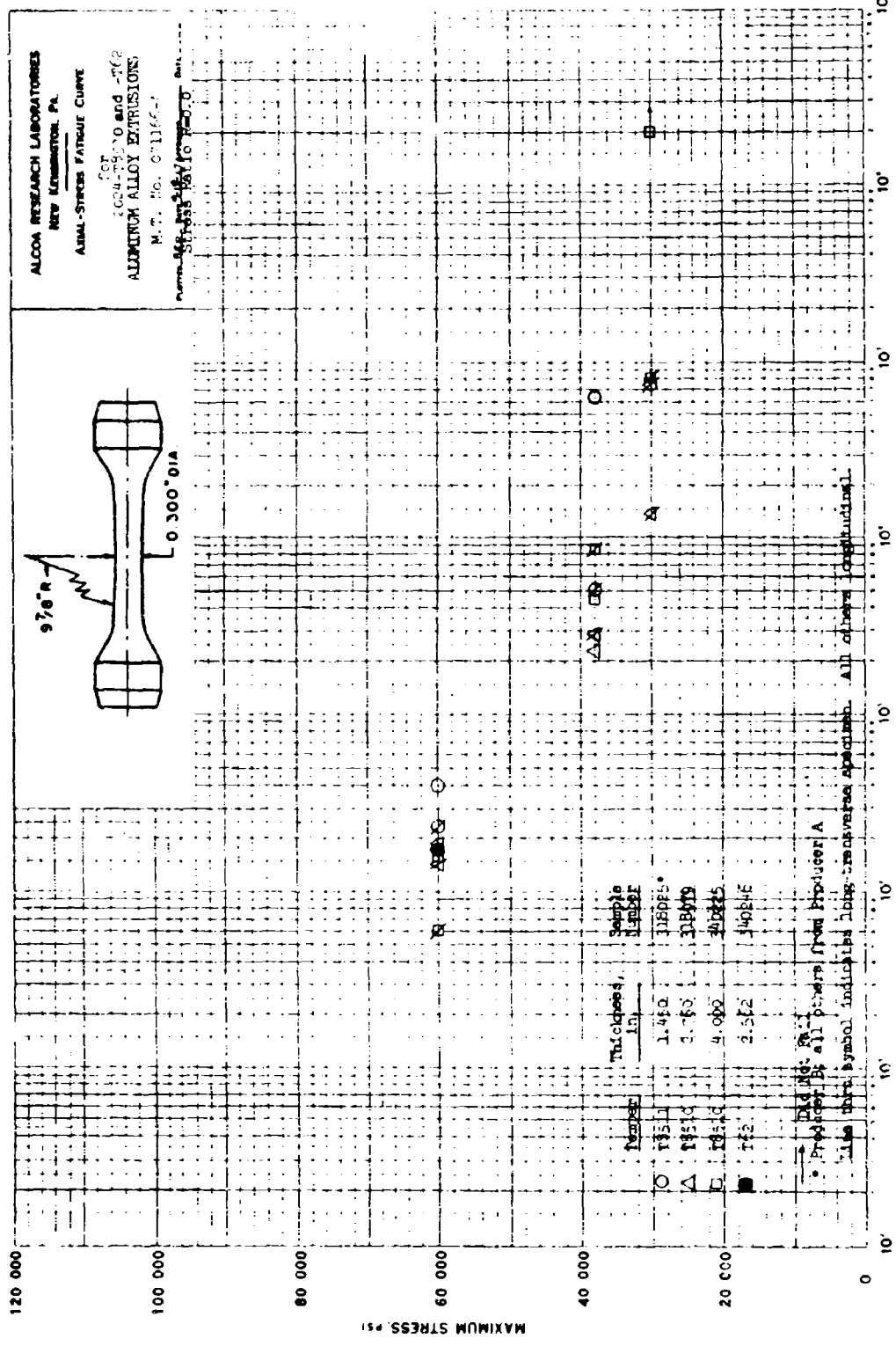
TABLE IX

2014-76510  
Aluminum Alloy Extrusions  
M.T. No. 071166-A  
Form 100 Rev. 1-1-63



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P. 8. 3

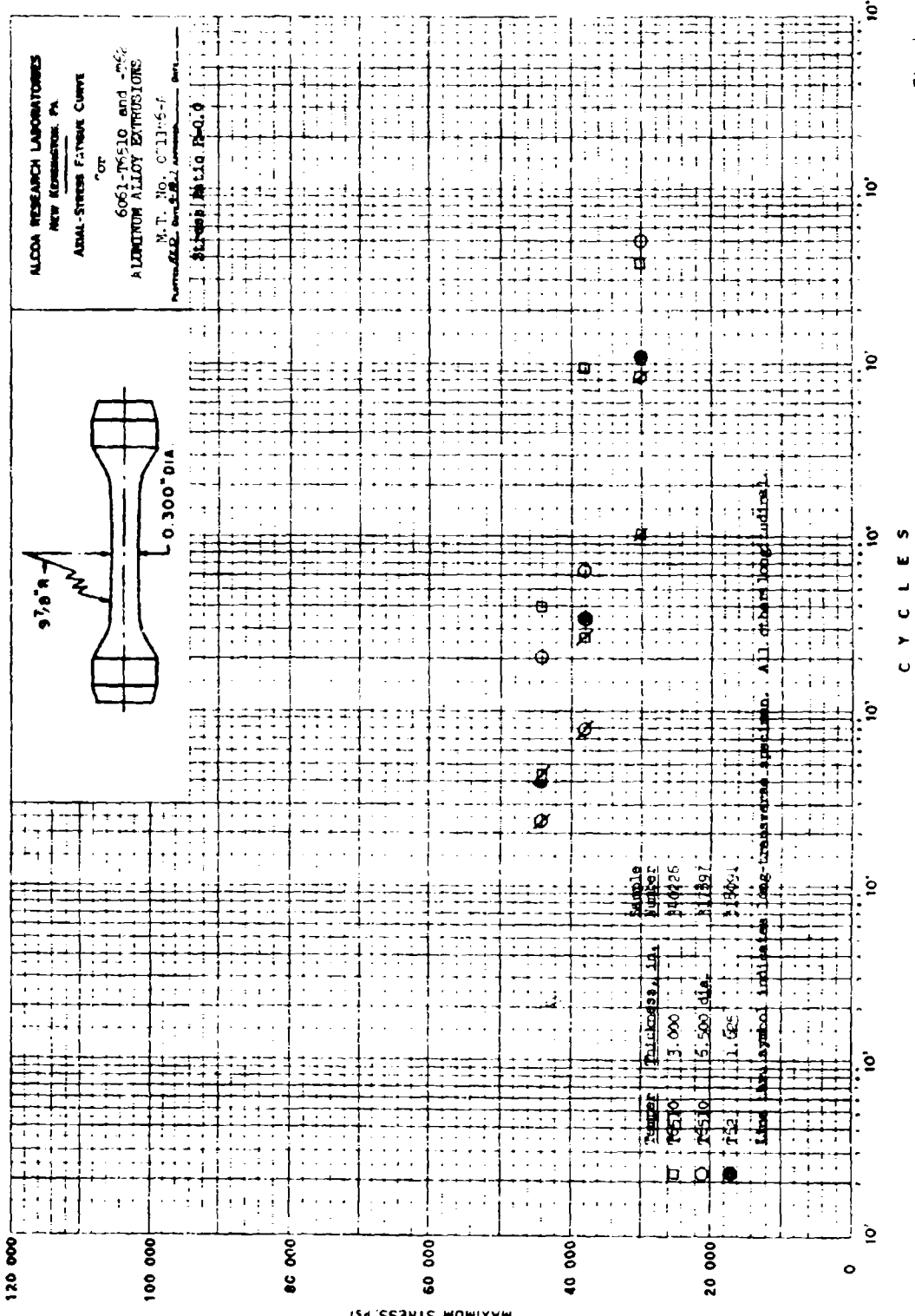


Fig. 4

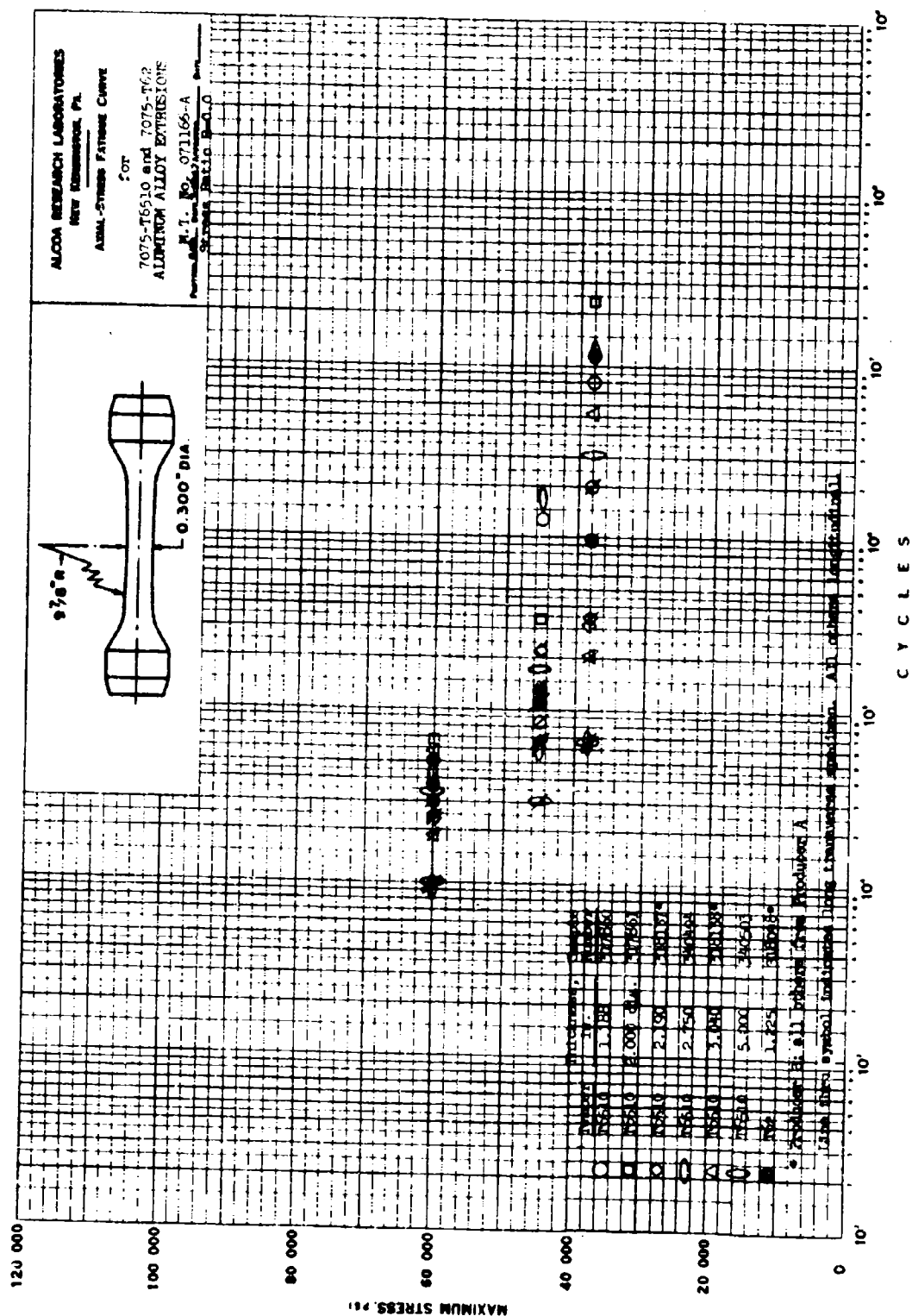


Fig. 5

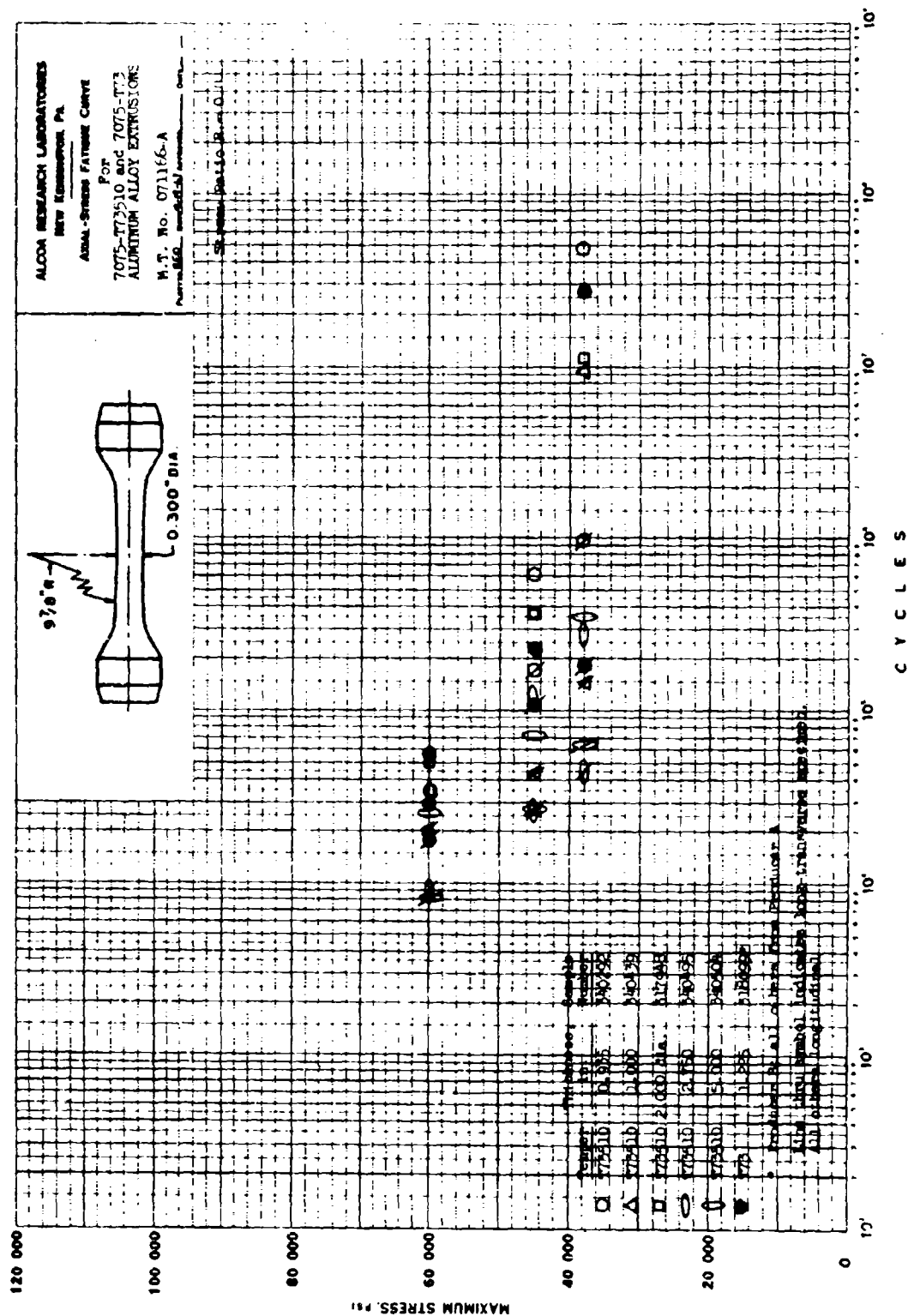


Fig. 5

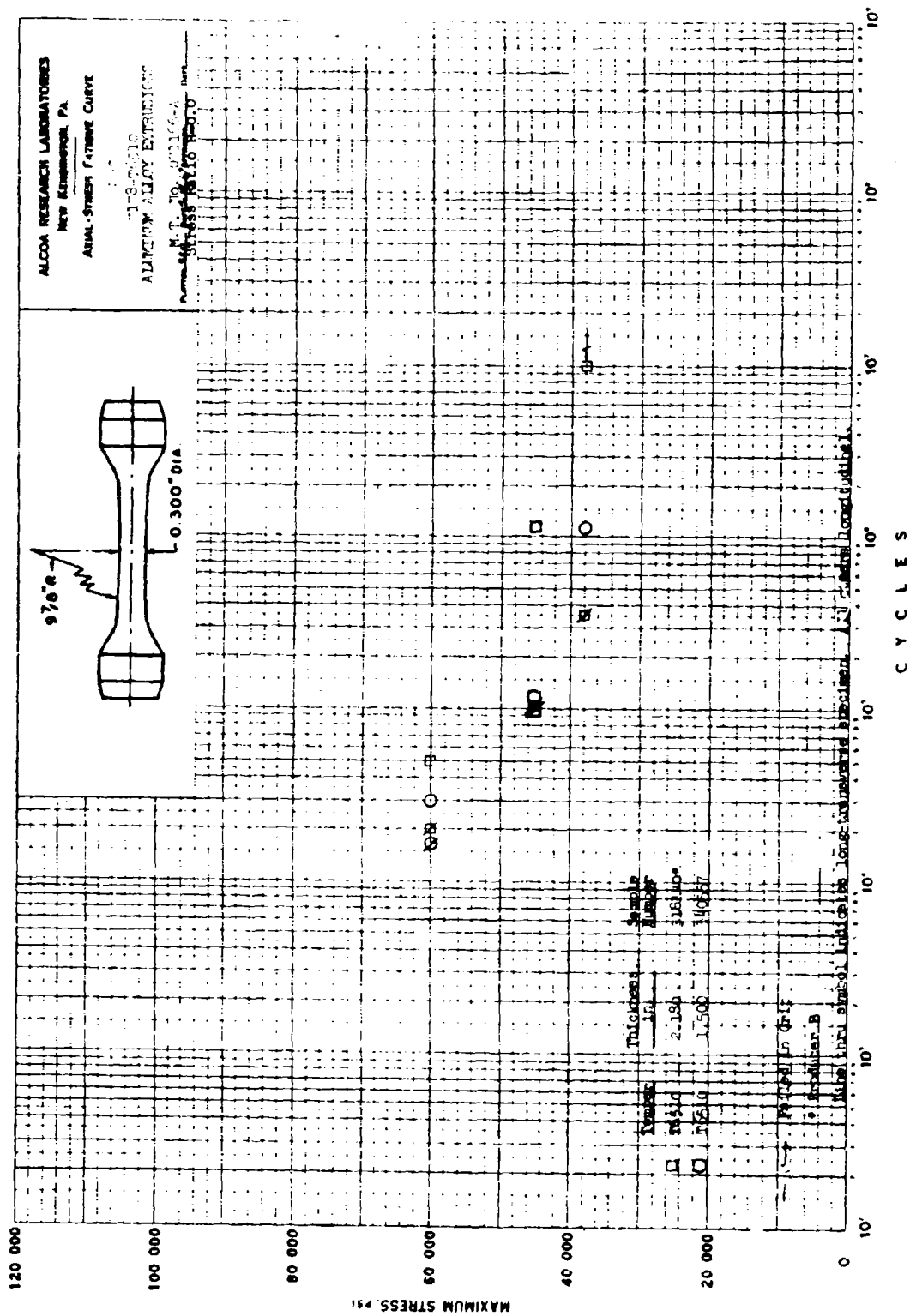


Fig. 7